

## CLAIMS

What is claimed is:

1. A method for the removal of airborne molecular contaminants (AMC) from a surface, comprising:
  - contacting at least a portion of the area surrounding a surface with a purified purge gas, wherein the purge gas comprises oxygen, water or a combination thereof, and the purified purge gas has an AMC concentration less than about 1 part per billion (ppb) on a volume basis;
  - producing a contaminated purge gas by transferring a portion of the contaminants from the surface into the purified purge gas; and
  - removing the contaminated purge gas from the area surrounding the surface.
2. A method for the removal of airborne molecular contaminants (AMC) from a surface, comprising:
  - purifying a purge gas to produce a purified purge gas, wherein the purge gas comprises oxygen and the purified purge gas has an AMC concentration less than about 1 part per billion (ppb) on a volume basis;
  - contacting at least a portion of the area surrounding a surface with the purified purge gas;
  - producing a contaminated purge gas by transferring a portion of the contaminants from the surface into the purified purge gas; and
  - removing the contaminated purge gas from the area surrounding the surface.
3. The method as in claim 2, wherein the method is repeated until the contaminant concentration in the contaminated purge gas is below about 1 ppb AMC on a volume basis.
4. The method as in claim 2, wherein the purified purge gas has a concentration of less than about 100 parts per trillion (ppt) AMC on a volume basis.

5. The method as in claim 2, wherein the purified purge gas has a contaminant concentration of less than about 10 ppt AMC on a volume basis.
- 5 6. The method as in claim 2, wherein the purified purge gas has a contaminant concentration of less than about 1 ppt AMC on a volume basis.
7. The method as in claim 2, wherein the purified purge gas further comprises water.
- 10 8. The method as in claim 7, wherein the water comprises about 100 parts per million (ppm) to about 2% by volume of the purge gas.
9. The method as in claim 8, wherein the water comprises about 100 ppm to  
15 about 0.5% by volume of the purge gas.
10. The method as in claim 2, wherein the surface comprises an interior surface of a device wherein the device encloses a space.
- 20 11. The method of claim 10, wherein the device encloses at least one silicon substrate.
12. The method of claim 2, wherein the surface is the interior surface of an ultrahigh purity gas line component.
- 25 13. The method of claim 2, wherein the surface is the interior surface of a valve.
14. The method as in claim 2, further comprising purging the device with an inert gas after removing said contaminated gas from said device.
- 30 15. The method as in claim 14, wherein said inert gas is selected from the group consisting of nitrogen, argon, noble gases, methane and combinations thereof.

16. A method for the removal of airborne molecular contaminants (AMC) from a surface, comprising:
- 5           purifying a purge gas to produce a purified purge gas, wherein the purge gas comprises oxygen at a concentration between about 1% and 25% on a volume basis and the purified purge gas has an AMC concentration less than about 1 part per billion (ppb) on a volume basis;
- contacting at least a portion of the area surrounding a surface with the purified purge gas;
- 10           producing a contaminated purge gas by transferring a portion of the contaminants from the surface into the purified purge gas; and
- removing the contaminated purge gas from the area surrounding the surface.
- 15   17. A method as in claim 16, comprising continuing the method until the contaminant concentration in the contaminated purge gas is below 1 ppb on a volume basis.
18. The method as in claim 16, wherein the purified purge gas has a contaminant concentration of less than 10 parts per trillion (ppt) AMC on a volume basis.
- 20   19. The method as in claim 16, wherein the purified purge gas has a contaminant concentration of less than 1 ppt AMC on a volume basis.
- 25   20. The method as in claim 16, wherein the purified purge gas further comprises water.
21. The method as in claim 20, wherein the water comprises about 100 parts per million (ppm) to about 2% by volume of the purge gas.
- 30   22. The method as in claim 16, wherein the surface comprises an interior surface of a device wherein the device encloses a space.

23. The method as in claim 22, wherein the device encloses at least one silicon substrate.
24. A method for the removal of airborne molecular contaminants (AMC) from a surface, comprising:  
5 purifying a purge gas to produce a purified purge gas, wherein the purge gas comprises water and the purified purge gas has an AMC concentration less than about 1 part per billion (ppb) on a volume basis;  
contacting at least a portion of the area surrounding a surface with the  
10 purified purge gas;  
producing a contaminated purge gas by transferring a portion of the contaminants from the surface into the purified purge gas; and  
removing the contaminated purge gas from the area surrounding the surface.
- 15 25. The method as in claim 24, wherein the steps are repeated until said contaminant concentration in the contaminated purge gas is below about 1 ppb on a volume basis.
- 20 26. The method as in claim 24, wherein the purified purge gas has a contaminant concentration of less than about 10 parts per trillion (ppt) AMC on a volume basis.
- 25 27. The method as in claim 24, wherein the purified purge gas has a contaminant concentration of less than about 1 ppt AMC on a volume basis.
28. The method as in claim 24, wherein the water comprises 100 parts per million (ppm) to 2% by volume of the purge gas.
- 30 29. The method as in claim 28, wherein the water comprises 100 ppm to 0.5% by volume of the purge gas.

30. The method as in claim 24, further comprising purging the device with an inert gas after removing said contaminated gas from said device.
- 5 31. The method as in claim 30, wherein said inert gas is selected from the group consisting of nitrogen, argon, noble gases, methane and combinations thereof.
32. The method as in claim 24, wherein the surface comprises an interior surface of a device wherein the device encloses a space.
- 10 33. A method as described in claim 32, wherein the device encloses at least one silicon substrate.
34. The method of claim 24, wherein the surface is the interior surface of an ultrahigh purity gas line component.
- 15 35. The method of claim 24, wherein the surface is the interior surface of a valve.